Functional Specifications

DⅢ-NET/Modbus Communication adaptor

【Model name：DTA116A51】

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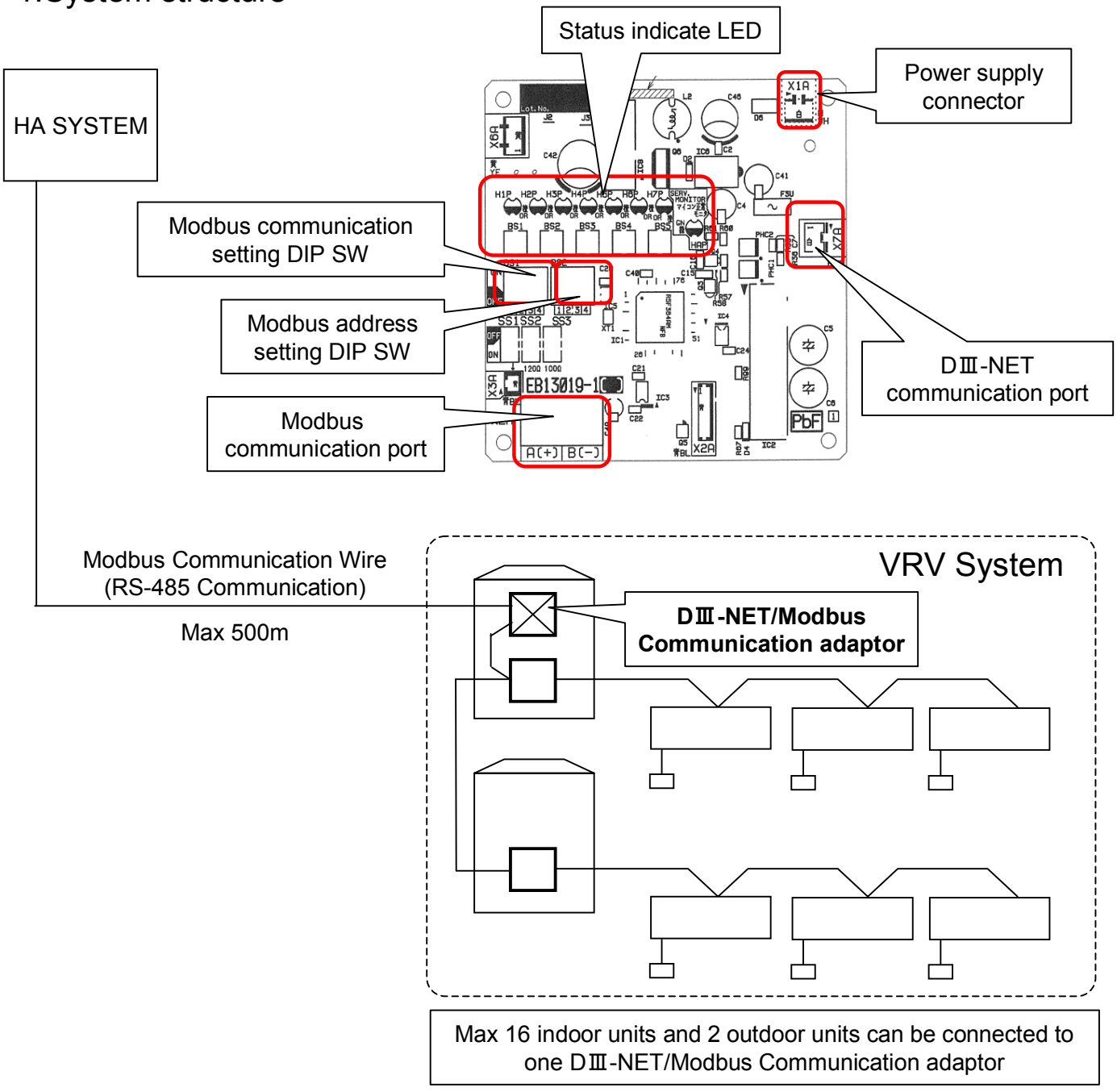
1.Introduction

- To use DⅢ-NET/Modbus Communication adaptor, Home Automation system can control VRV with modbus protocol.

1-1.System structure



1-2.Limitations of DⅢ-NET/Modbus Communication adaptor

- The number of control command for one indoor unit must be within 7,000 times per year.
- If HA System controls VRV by using automatic control program, please make sure don't exceed this limitation.

1-3.Functions

Monitor

On/Off	On/Off status of indoor units
Operation mode	Cooling, Heating, Fan, Dry, Auto (depend on indoor unit capability)
Setpoint	Setpoint of indoor units
Room temperature	Suction temperature of indoor units
Fan direction	Swing, Flap direction (depend on indoor unit capability)
Fan volume	L, M, H (depend on indoor unit capability)
Forced off status	Forced off status of indoor units
Error	Malfunction, Warning with Error code
Filter sign	Filter sign of indoor units
Communication status	Communication error of indoor units

Control

On/Off	On/Off control of indoor units
Operation mode	Cooling, Heating, Fan, Dry, Auto (depend on indoor unit capability)
Setpoint	Cooling/Heating setpoint
Fan direction	Swing, Stop, Flap direction (depend on indoor unit capability)
Fan volume	L, M, H (depend on indoor unit capability)
Filter sign reset	Reset filter sign of indoor units

Retrieve VRV System information

Connected indoor units	How many indoor units are connected and DⅢ-NET address of each indoor unit
Indoor unit capabilities	Cooling/Heating/Fan/Dry/Auto mode, Fan direction, Fan volume and steps(fix, 2step, 3step), Setpoint range(cooling/heating)

LED indication

H1P	Turn on when the adaptor send out DⅢ-NET command
H2P	Turn on when the adaptor receive DⅢ-NET command
H3P	Turn on when the adaptor send out modbus command
H4P	Turn on when the adaptor receive modbus command
H5P	Not use
H6P	Not use
H7P	Not use
HAP	Blink in 400ms interval after power supply

2.Modbus communication

- This DⅢ-NET/Modbus Communication adaptor is a modbus slave.
- Communication format and function code are according to “Modicon Modbus Protocol Reference Guide”(PI-MBUS-300 Rev.J).

2-1.Adaptor setting

- Modbus communication parameter is set by DS1.
- Modbus address of this adaptor is set by DS2.

DS	pin	Function	OFF	ON
DS1	1	Reserve	-	-
	2	Baud Rate	9600bps	19200bps
	3	Stop Bit	Stop Bit 1 (Parity)	Stop Bit 2 (Non Parity)
	4	Parity*	Even	Odd
		* Parity setting will enable when DS1-3 is off.		
DS2	1	Slave Address	0: No modbus communication 1 – 15: Slave Address 1 –15 *1:off, 2:off, 3:off, 4:on is 1	
	2			
	3			
	4			

2-2.Communication format

2-2-1.Transmission mode

This DⅢ-NET/Modbus Communication adaptor uses RTU mode.

2-2-2.Data types

Following data types are supported.

Data Type	Length	Address range
Input Register	16 bits	30001 – 39999
Holding Register	16 bits	40001 - 49999

* Data bigger than 16 bits can be handled by assigning continuous address to registers.

2-2-3.Function codes

Following function codes are supported. If the DⅢ-NET/Modbus Communication adaptor receive a function code which are not included in this table, the function code will treat as a illegal function and the adaptor returns exception response.

Function Code	Message	broadcast
0x04(04)	Read Input Register	
0x06(06)	Preset single Register	X
0x10(16)	Preset Multiple Registers	X

*"X" : Not Support

2-2-4.Function format

(1) Read Input Register (0x04)

[Function]
Read values of input registers. The address and the content of input registers are described in "3. Modbus registers".

[Query]
The query message specifies the start address of the register and the number of registers. The register addressed starting at zero: register 30001 is addressed as 0.
This function can read up to 32 registers at one query.
Here is an example of a request to slave address 1 to read 3 registers value from register 31001.

Query

Field	Data
Slave Address	0x01
Function Code	0x04
Start Address(Upper)	0x03
Start Address(Lower)	0xE8
Number of Registers(Upper)	0x00
Number of Registers(Lower)	0x03
Error Check CRC16(Lower)	0x30
Error Check CRC16(Upper)	0x7B

Response

Field	Data
Slave Address	0x01
Function Code	0x04
Data Size(Bytes)	0x06
Data1(Upper)	0xXX
Data1(Lower)	0xXX
Data2(Upper)	0xXX
Data2(Lower)	0xXX
Data3(Upper)	0xXX
Data3(Lower)	0xXX
Error Check CRC16(Lower)	0xXX
Error Check CRC16(Upper)	0xXX

(2) Preset single register (0x06)

[Function]
Write a value to a holding register. In the case of broadcast, the value is written to the same holding register on the all slave units. The address and the content of holding registers are described in “3. Modbus registers”.

[Query]
The query message specifies the start address of the register and a value. The register addressed starting at zero: register 40001 is addressed as 0.
Here is an example of a request to slave address 1 to write a value 2 to register 42002.

Query

Field	Data
Slave Address	0x01
Function Code	0x06
Address(Upper)	0x07
Address(Lower)	0xD1
Value(Upper)	0x00
Value(Lower)	0x02
Error Check CRC16(Lower)	0x59
Error Check CRC16(Upper)	0x46

Response

Field	Data
Slave Address	0x01
Function Code	0x06
Address(Upper)	0x07
Address(Lower)	0xD1
Value(Upper)	0x00
Value(Lower)	0x02
Error Check CRC16(Lower)	0x59
Error Check CRC16(Upper)	0x46

(3) Preset multiple registers (0x10)

[Function]
Write values to holding registers. In the case of broadcast, the value is written to the same holding register on the all slave units. The address and the content of holding registers are described in “3. Modbus registers”.

[Query]
The query message specifies the start address of the register, size of data and values. The register addressed starting at zero: register 40001 is addressed as 0.
This function can write up to 30 registers at one query.
Here is an example of a request to slave address 1 to write 2 values to register 42001 to 42002.

Query

Field	Data
Slave Address	0x01
Function Code	0x10
Start Address(Upper)	0x07
Start Address(Lower)	0xD0
Number of Registers(Upper)	0x00
Number of Registers(Lower)	0x02
Data Size(bytes)	0x04
Value1(Upper)	0x00
Value1(Lower)	0x10
Value2(Upper)	0x00
Value2(Lower)	0x01
Error Check CRC16(Lower)	0x18
Error Check CRC16(Upper)	0xC6

Response

Field	Data
Slave Address	0x01
Function Code	0x10
Start Address(Upper)	0x07
Start Address(Lower)	0xD0
Number of Registers(Upper)	0x00
Number of Registers(Lower)	0x02
Error Check CRC16(Lower)	0x41
Error Check CRC16(Upper)	0x45

(4) Exception response

In the case query message has a problem, this DⅢ-NET/Modbus Communication adaptor will reply exception response. The function code of exception response is added 0x80 to original function code to inform this response is exception response. And the exception response include exception code which shows reason of the problem.

Exception code	Name	Reason
0x01	Illegal function	This function code is not supported
0x03	Illegal data	This query includes unauthorized data

[Example of exception response]

・In the case of reading values of 36 input registers: start address:31001.
It is up to 32 registers that this function can read at one query.

Query

Field	Data
Slave Address	0x01
Function Code	0x04
Start Address(Upper)	0x03
Start Address(Lower)	0xE8
Number of Registers(Upper)	0x00
Number of Registers(Lower)	0x24
Error Check(Lower)	0x70
Error Check(Upper)	0x61

Response

Field	Data
Slave Address	0x01
Function Code	0x84
Exception Code	0x03
Error Check(Lower)	0x03
Error Check(Upper)	0x01

2-2-5.Character format

Each byte of a message is sent as character data as follows.
A character consists of start bit (0), 8bits data, parity bit and stop bit(1). One character size is always 11btis and stop bit 1 or 2 is selected by parity bit.

[Non Parity]

0(LSB)	1	2	3	4	5	6	7	8	9	10(MSB)
Start bit	Data								Stop bit 1	Stop bit 2

[Parity]

0(LSB)	1	2	3	4	5	6	7	8	9	10(MSB)
Start bit	Data								Parity bit (Odd or Even)	Stop bit 2

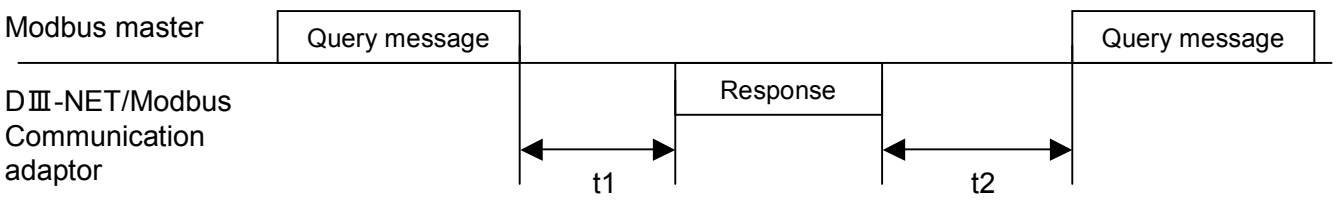
2-2-6.Silent interval time

Every frame has to have silent interval time(T1-T2-T3-T4) before and after. The silent interval time is depend on communication speed.

Baud Rate(bps)	9600	19200
Silent Interval Time(ms) (T1-T2-T3-T4)	5	2.5

2-2-7.Response time

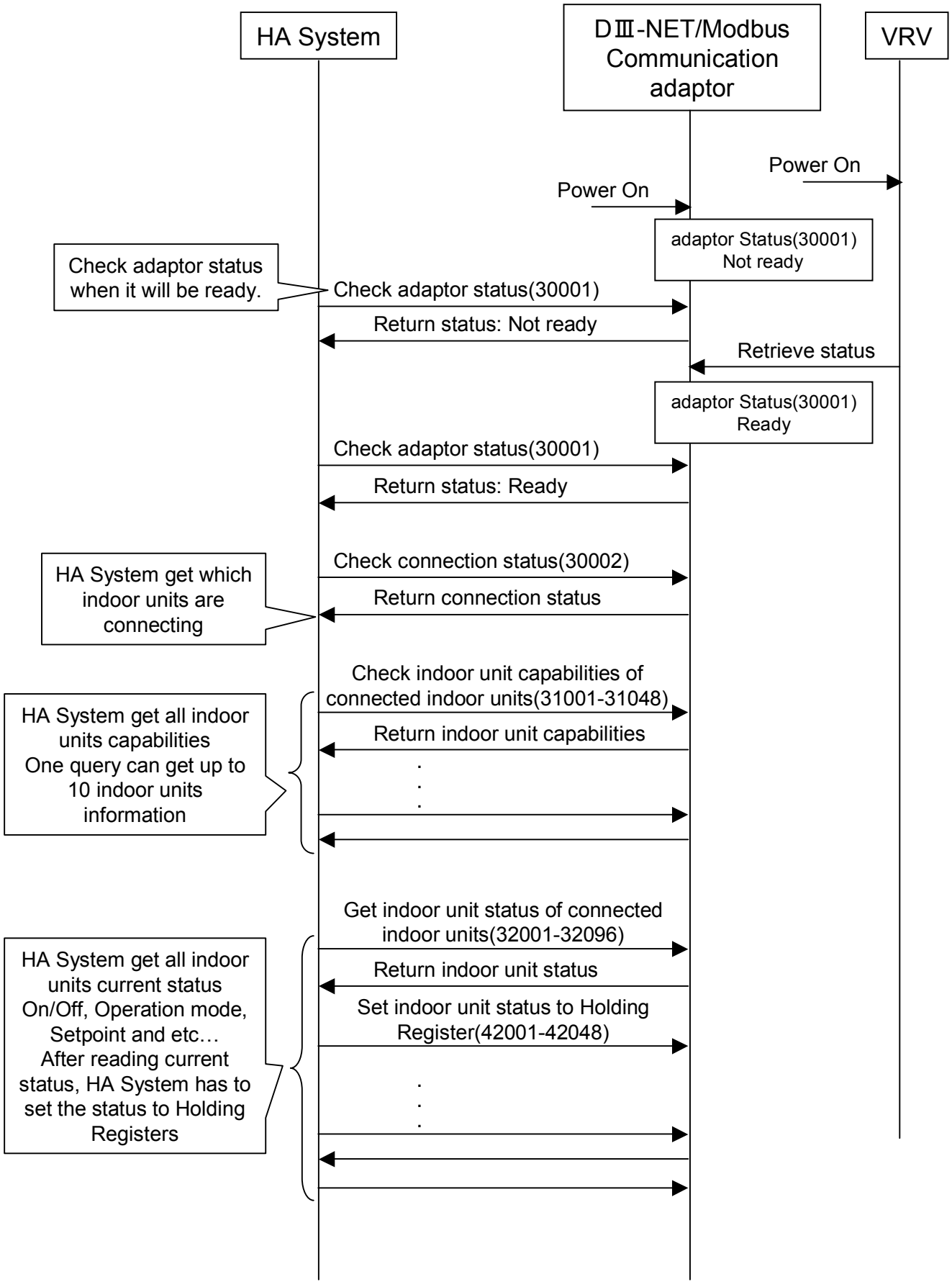
This DⅢ-NET/Modbus Communication adaptor response a message after response time(t1) when this adaptor receives a query message. The response time(t1) of this adaptor is “Silent Interval Time(T1-T2-T3-T4) + 20ms”.
Modbus master has to wait to send next query message for time interval(t2) when the modbus master receives a response from the DⅢ-NET/Modbus Communication adaptor . The time interval(t2) should be more than “Silent Interval Time(T1-T2-T3-T4) + 20ms”.



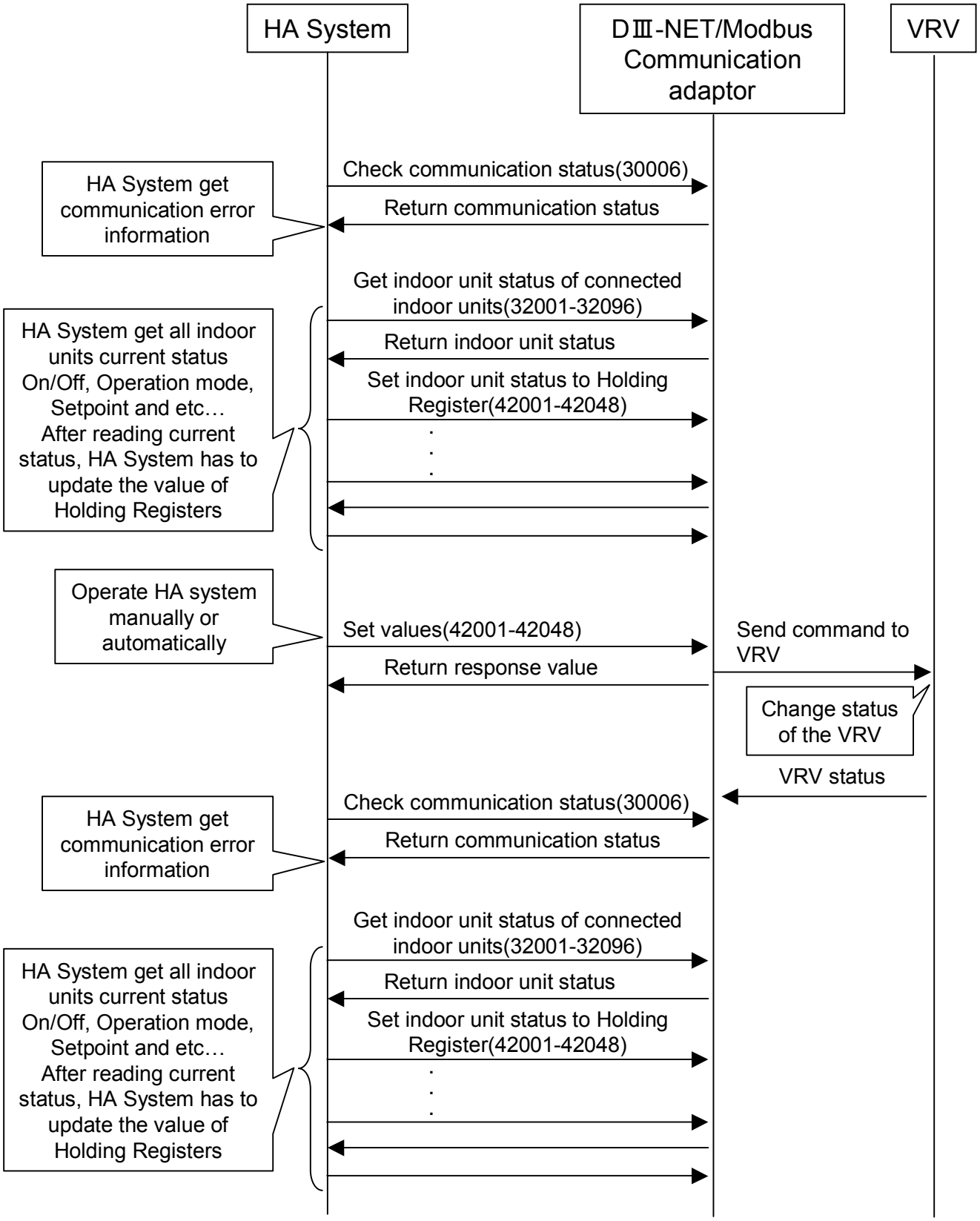
t1 = (T1-T2-T3-T4) + 20 (ms) t2 >= (T1-T2-T3-T4) + 20 (ms)

2-3.Communication procedure

2-3-1.System initialization



2-3-2.Monitor and operate VRV from HA System



Note

DⅢ-NET/Modbus Communication adaptor send a command to VRV when the value of a Holding Register is changed. So HA System has to update Holding Register values when HA System read current status from Input Registers. Otherwise an operation from the HA system will be ignored.(Refer to 5.Important points on operation by HA system)

3.Modbus registers

- This section shows registers of this DⅢ-NET/Modbus Communication adaptor.
- Detail of the register is described in 4.Modbus register structure.

3-1.Input register

3-1-1. Adaptor status

Address	Contents
30001	Status of the adaptor

3-1-2. Indoor unit connection status

Address	Contents
30002	Connection status of indoor units (1-00 to 1-15)

3-1-3. Indoor unit communication status

Address	Contents
30006	Communication status of indoor units (1-00 to 1-15)

3-1-4. Indoor unit capability information

Address	Indoor unit address
31001 – 31003	1-00
31004 – 31006	1-01
31007 – 31009	1-02
31010 – 31012	1-03
31013 – 31015	1-04
31016 – 31018	1-05
31019 – 31021	1-06
31022 – 31024	1-07

Address	Indoor unit address
31025 – 31027	1-08
31028 – 31030	1-09
31031 – 31033	1-10
31034 – 31036	1-11
31037 – 31039	1-12
31040 – 31042	1-13
31043 – 31045	1-14
31046 – 31048	1-15

3-1-5. Indoor unit status information

Address	Indoor unit address
32001 – 32006	1-00
32007 – 32012	1-01
32013 – 32018	1-02
32019 – 32024	1-03
32025 – 32030	1-04
32031 – 32036	1-05
32037 – 32042	1-06
32043 – 32048	1-07

Address	Indoor unit address
32049 – 32054	1-08
32055 – 32060	1-09
32061 – 32066	1-10
32067 – 32072	1-11
32073 – 32078	1-12
32079 – 32084	1-13
32085 – 32090	1-14
32091 – 32096	1-15

3-2.Holding register

3-2-1. Adaptor initial setting

Address	Contents
40001	DⅢ-NET setting

3-2-2. Indoor unit control

Address	Indoor unit address
42001 – 42003	1-00
42004 – 42006	1-01
42007 – 42009	1-02
42010 – 42012	1-03
42013 – 42015	1-04
42016 – 42018	1-05
42019 – 42021	1-06
42022 – 42024	1-07

Address	Indoor unit address
42025 – 42027	1-08
42028 – 42030	1-09
42031 – 42033	1-10
42034 – 42036	1-11
42037 – 42039	1-12
42040 – 42042	1-13
42043 – 42045	1-14
42046 – 42048	1-15

4.Modbus register structure

4-1.Input register

4-1-1. Adaptor status

Register Number	30001
Type	Input Register
Composition	

(1) adaptor status (0 or 1)
This register stores adaptor status.
0: Not ready
1: Ready

4-1-2. Indoor unit connection status

Register Number	30002
Type	Input Register
Composition	

7	6	5	4	3	2	1	0	
(8)	(7)	(6)	(5)	(4)	(3)	(2)	(1)	Lower
(16)	(15)	(14)	(13)	(12)	(11)	(10)	(9)	Upper
15	14	13	12	11	10	9	8	

(1) Indoor unit connection status (0 or 1)
This register stores indoor unit connection status of the DⅢ-NET address 1-00.
0: Unconnected
1: Connected

(2) Indoor unit connection status (0 or 1)
This register stores indoor unit connection status of the DⅢ-NET address 1-01.
0: Unconnected
1: Connected

…..

(16) Indoor unit connection status (0 or 1)
This register stores indoor unit connection status of the DⅢ-NET address 1-15.
0: Unconnected
1: Connected

4-1-3. Indoor unit communication status

Register Number	30006
Type	Input Register
Composition	

7	6	5	4	3	2	1	0	
(8)	(7)	(6)	(5)	(4)	(3)	(2)	(1)	Lower
(16)	(15)	(14)	(13)	(12)	(11)	(10)	(9)	Upper
15	14	13	12	11	10	9	8	

(1) Indoor unit communication status (0 or 1)
This register stores indoor unit communication status of the DⅢ-NET address 1-00.
0: Normal
1: Communication Error

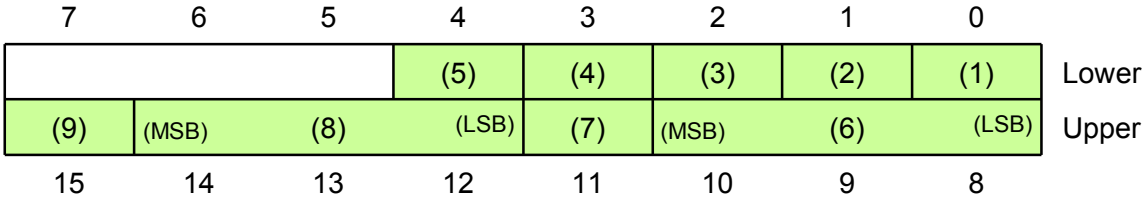
(2) Indoor unit communication status (0 or 1)
This register stores indoor unit communication status of the DⅢ-NET address 1-01.
0: Normal
1: Communication Error

…..

(16) Indoor unit communication status (0 or 1)
This register stores indoor unit communication status of the DⅢ-NET address 1-15.
0: Normal
1: Communication Error

4-1-4. Indoor unit capability information

Register Number	31001, 31004, …., 31046
Type	Input Register
Composition	



(1) Fan mode capability (0 or 1)
This register stores indoor unit capability of “Fan Mode”.
0: Not exist
1: Exist

(2) Cooling mode capability (0 or 1)
This register stores indoor unit capability of “Cooling Mode”.
0: Not exist
1: Exist

(3) Heating mode capability (0 or 1)
This register stores indoor unit capability of “Heating Mode”.
0: Not exist
1: Exist

(4) Auto mode capability (0 or 1)
This register stores indoor unit capability of “Auto Mode”.
0: Not exist
1: Exist

(5) Dry mode capability (0 or 1)
This register stores indoor unit capability of “Dry Mode”.
0: Not exist
1: Exist

(6) Fan direction level capability (0 - 7)
This register stores indoor unit capability of “Fan Direction Level”.
This value has no meaning when (7): Fan direction capability is 0.

Value	0	1	2	3	4	5	6	7
Capability	-	Fix	2 step	3 step	4 step	5 step	-	-

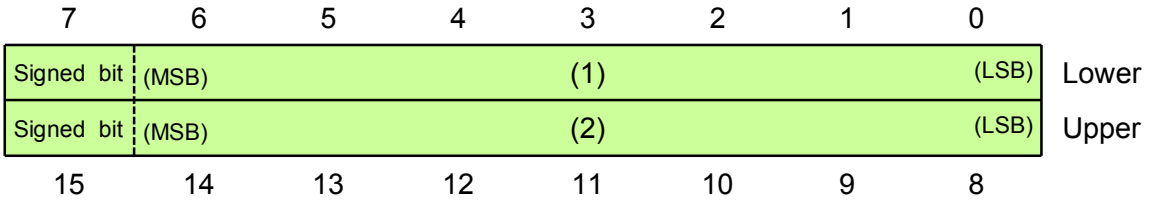
(7) Fan direction capability (0 or 1)
This register stores indoor unit capability of “Fan Direction”.
0: Not exist
1: Exist

(8) Fan volume level capability (0 - 7)
This register stores indoor unit capability of “Fan Volume Level”.
This value has no meaning when (9): Fan volume capability is 0.

Value	0	1	2	3	4	5	6	7
Capability	-	Fix	2 step	3 step	-	-	-	-

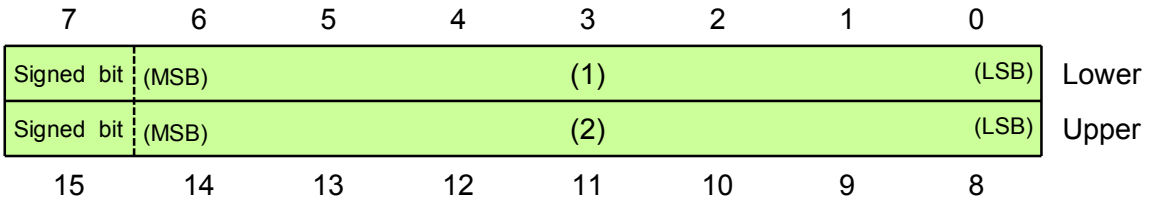
(9) Fan volume capability (0 or 1)
This register stores indoor unit capability of “Fan Volume”.
0: Not exist
1: Exist

Register Number	31002, 31005, …., 31047
Type	Input Register
Composition	



(1) Indoor unit cooling setpoint upper limit (-128 – 127degC)
This register stores indoor unit cooling mode setpoint upper limit.
8bit signed integer
(2) Indoor unit cooling setpoint lower limit (-128 – 127degC)
This register stores indoor unit cooling mode setpoint lower limit.
8bit signed integer

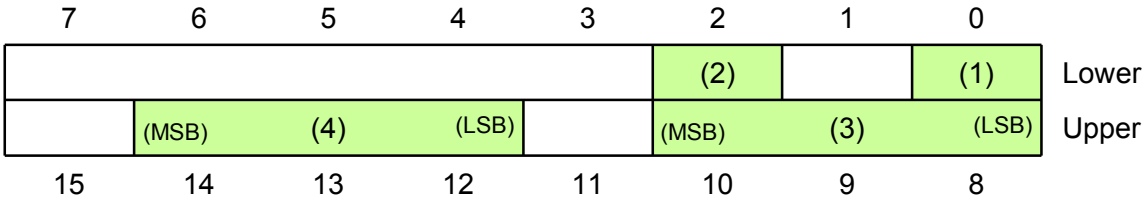
Register Number	31003, 31006, …., 31048
Type	Input Register
Composition	



(1) Indoor unit heating setpoint upper limit (-128 – 127degC)
This register stores indoor unit heating mode setpoint upper limit.
8bit signed integer
(2) Indoor unit heating setpoint lower limit (-128 – 127degC)
This register stores indoor unit heating mode setpoint lower limit.
8bit signed integer

4-1-5. Indoor unit status information

Register Number	32001, 32007, …., 32091
Type	Input Register
Composition	



(1) On/Off status (0 or 1)
This register stores indoor unit on/off status.
0: Off
1: On

(2) Forced off status (0 or 1)
This register stores indoor unit forced off status.
0: none
1: Forced off

(3) Fan direction (0 - 7)
This register stores indoor unit fan direction position.

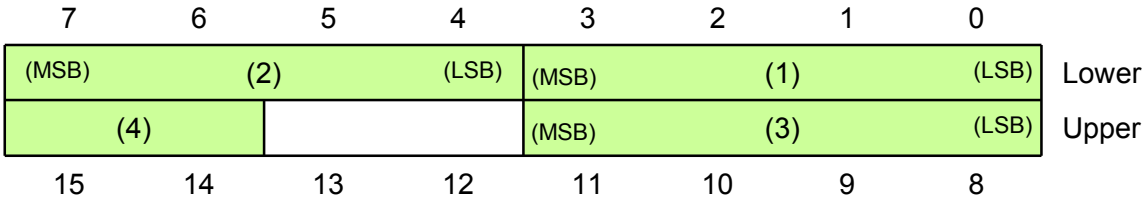
Value	0	1	2	3	4	5	6	7
Position	P0	P1	P2	P3	P4	-	-	Swing

*P0: horizontal direction, P4: vertical direction

(4) Fan volume (1 - 7)
This register stores indoor unit fan volume.
The meaning of this value is different from fan volume capabilities as bellow table.

Value	0	1	2	3	4	5	6	7
Fix	-	-	-	-	-	H	-	-
2Step	-	L	-	-	-	H	-	-
3Step	-	L	-	M	-	H	-	-

Register Number	32002, 32008, …., 32092
Type	Input Register
Composition	



(1) Operation mode (0 - 7)
This register stores indoor unit operation mode.

Value	0	1	2	3	4	5	6	7
Mode	Fan	Heating	Cooling	Auto	-	-	-	Dry

(2) Filter sign status (0 or 1-15)
This register stores indoor unit filter sign status.
0: Off
1-15: On

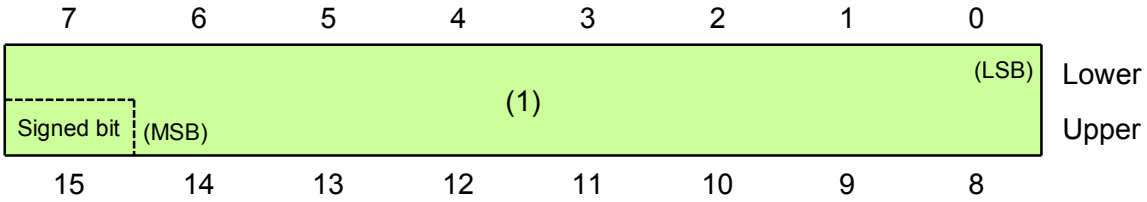
(3) Operation status (0 - 2)
This register stores indoor unit current operation status.

Value	0	1	2
Mode	Fan	Heating	Cooling

(4) Cool/Heat master (0 - 2)
This register stores Cool/Heat master information.
If this value is 2, it can be changed cooling/heating for this VRV system through this indoor unit.
If this value is 0, Cool/Heat master for this VRV system is not decided.

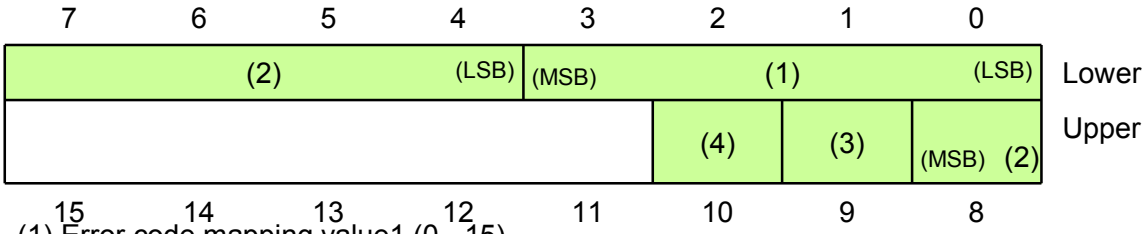
Value	0	1	2
Status	Not decided	Slave	Master

Register Number	32003, 32009, …., 32093
Type	Input Register
Composition	



(1) Setpoint (-127.9 – 127.9 degC)
This register stores indoor unit setpoint (0.1 degC step).
This value multiplied by 10 to store as an integer value.
16bit signed integer

Register Number	32004, 32010, …., 32094
Type	Input Register
Composition	



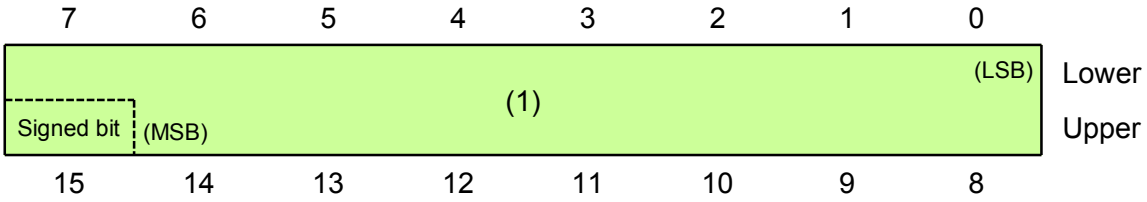
(1) Error code mapping value1 (0 - 15)
This register stores indoor unit Error Code mapping value.
This value is used with (2) to find Error Code in “6.Error code mapping table”.
4bit unsigned integer

(2) Error code mapping value2 (0 - 31)
This register stores indoor unit Error Code mapping value.
This value is used with (1) to find Error Code in “6.Error code mapping table”.
5bit unsigned integer

(3) Malfunction (0 or 1)
This register stores indoor unit error level.
0: Normal
1: Malfunction

(4) Warning (0 or 1)
This register stores indoor unit error level.
0: Normal
1: Warning

Register Number	32005, 32011, …., 32095
Type	Input Register
Composition	



(1) Room temperature (-511.9 – 511.9 degC)
This register stores temperature data of indoor unit sensor (0.1 degC step).
This value multiplied by 10 to store as an integer value.
16bit signed integer

Register Number	32006, 32012, …, 32096
Type	Input Register
Composition	

(1) Indoor unit temperature sensor error (0 or 1)
This register stores indoor unit temperature sensor has error or not.
0: Normal
1: Error

(2) Indoor unit temperature sensor data is received (0 or 1)
This register stores indoor unit temperature sensor data is already received or not.
0: Not received yet
1: Received

4-2.Holding register

4-2-1. Adaptor initial settings

Register Number	40001
Type	Holding Register
Composition	

(1) Managed DⅢ-NET address range (0 or 1)
This register defines the DⅢ-NET address(1-00 to 1-15) are managed or not.
Initial value is 1.
0: Out of manage
1: Managed

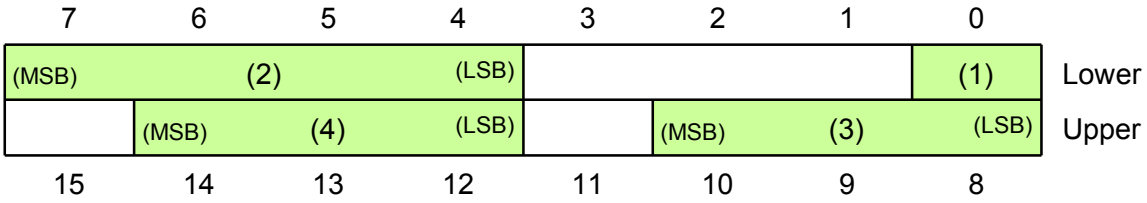
(2) DⅢ-NET master flag (0 or 1)
This register defines this adaptor is DⅢ-NET master or slave.
Initial value is 1.
If other central controller is installed for the VRV system, then this flag should be set to 0.
0: Slave
1: Master

(3) DⅢ-NET communication start/stop flag (0 or 1)
This register defines DⅢ-NET communication start or stop.
Initial value is 1.
0: Stop
1: Start

* Value of this register is stored to EEPROM, therefore the value will not be discarded when the adaptor power is off.
* When this register value is changed, new value is applied when the adaptor power is off and on.

4-2-2. Indoor unit control

Register Number	42001, 42004, …, 42046
Type	Holding Register
Composition	



(1) On/Off (0 or 1)
This register controls On/Off of the indoor unit.
0: Off
1: On

(2) Fan control flag (6)
This register has to be set to “6”.

(3) Fan direction (0 - 7)
This register controls fan direction position of the indoor unit.

Value	0	1	2	3	4	5	6	7
Position	P0	P1	P2	P3	P4	-	Stop	Swing

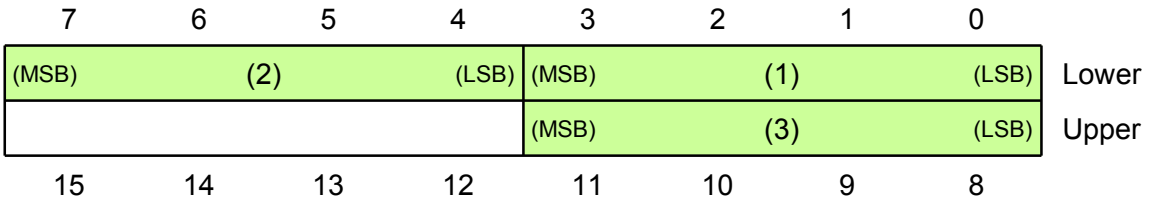
*P0: horizontal direction, P4: vertical direction

(4) Fan volume (0 - 7)
This register controls fan volume of the indoor unit.
The meaning of this value is different from fan volume capabilities as bellow table.

Value	0	1	2	3	4	5	6	7
2Step	-	L	-	-	-	H	-	-
3Step	-	L	-	M	-	H	-	-

* In the case of fan volume capability is 0, this value has to be set to “0”.

Register Number	42002, 42005, …, 42047
Type	Holding Register
Composition	



(1) Operation mode (0 - 7)

This register controls operation mode of the indoor unit.

Value	0	1	2	3	4	5	6	7
Mode	Fan	Heating	Cooling	Auto	-	-	Setpoint	Dry

* Setpoint is used when the indoor unit is not cool/heat master.

Note

When the following value is set to this register, the value is treated as an unauthorized data and DⅢ-NET/Modbus Communication adaptor sends the exceptional response.

- Set the value 0 for VRV having no Fan mode capability.
- Set the value 1 for VRV having no Heating mode capability.
- Set the value 2 for VRV having no Cooling mode capability.
- Set the value 3 for VRV which Cool/Heat master is 1:Slave.
- Set the value 3 for VRV having no Auto or no Heating and Cooling mode capability.
- Set the value 6 for VRV which Cool/Heat master is 2:Master.
- Set the value 6 for VRV having no Heating and Cooling mode capability.
- Set the value 7 for VRV having no Dry mode capability.
- Set the value shown “-” at the list previous.

(2) Filter sign reset (0 or 15)

This register resets filter sign of the indoor unit.

0: Non

15: Reset

Note

Please set value 0 to this entry after reset the filter sign. Otherwise filter sign will never appeared again.

(3) Operation status (0 - 2)

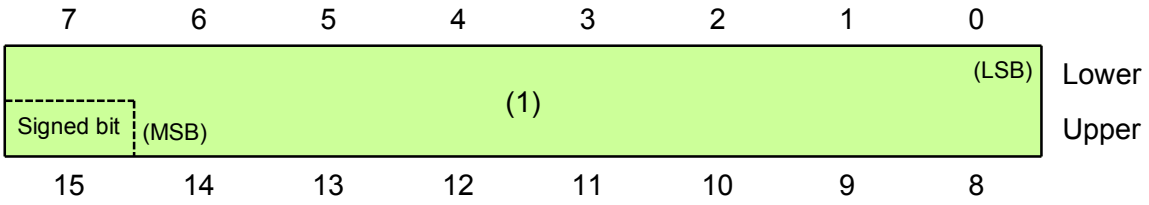
This register select setpoint for heating or cooling under Auto mode.

Before setting setpoint under Auto mode, this register has to be set to “1” or “2”.

Under other mode, it does not need to care this register.

Value	0	1	2
Mode	Don’t care	Heating	Cooling

Register Number	42003, 42006, …, 42048
Type	Holding Register
Composition	



(1) Setpoint (-127.9 – 127.9 degC)
This register controls setpoint of the indoor unit (0.1 degC step).
This value multiplied by 10 to store as an integer value.
16bit signed integer.

Note

On setting the Setpoint

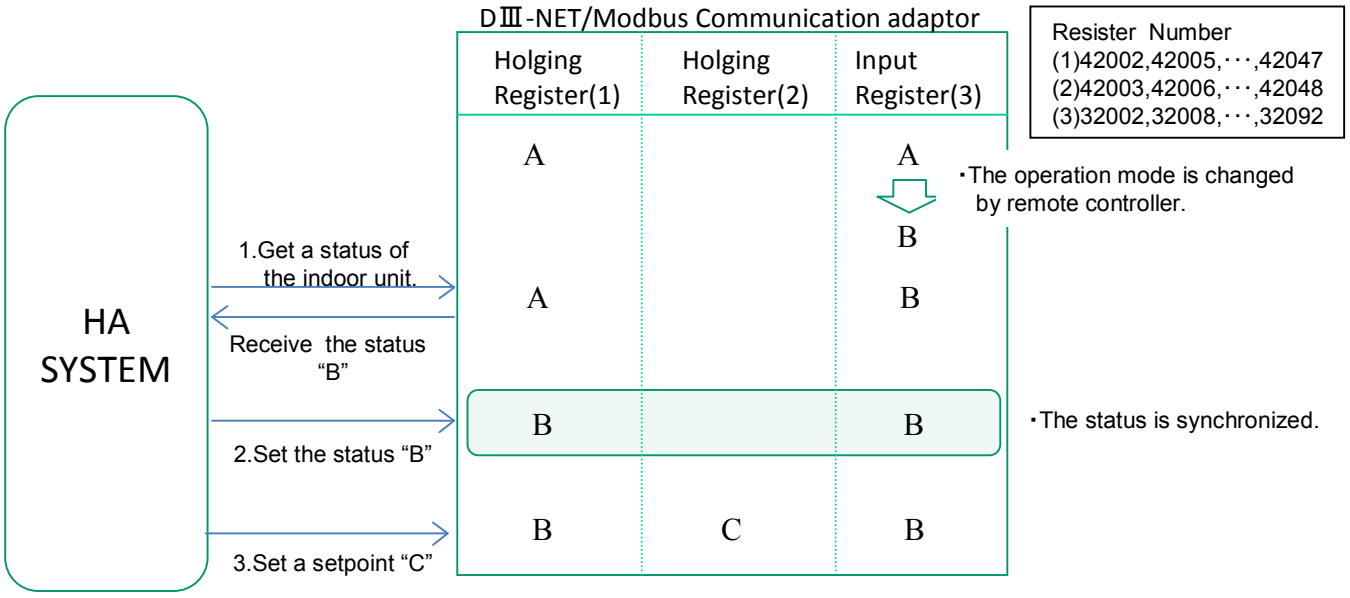
In case of connected outdoor units are “RQCEQ-PY1”, “Auto” can be set as operation mode.
If operation mode of each indoor unit is “Auto”, indoor units automatically change operation mode “Auto（Cooling）or Auto（Heating）” with the relation between room temperature and setpoint.

On operation mode “Auto”, setpoint may be changed automatically. In this case, setpoint on “Auto(Cooling)”and setpoint on “Auto(Heating)” may have the differential.

In case of setting setpoint after setting operation mode "Auto” from HA system, even if the operation mode is changed by remote controller, setting setpoint is treated as setpoint of operation mode "Auto", and setpoint may be different from setting value.

If the VRV system contains outdoor unit "RQCEQ-PY1", Holding Resister which contains operation mode must be synchronized on the status of indoor units by getting the status. After the synchronization, the settpoing must be set.

＜Operation for setting setpoint＞
*Please refer to below chart.
1.Get a value of Input Resister(3) which contains an operation mode of target indoor unit.(=“B”)
2.Set the getting value “B” to Holding Resister(1) for the target indoor unit.
3.Set a setpoint “C” for the target indoor unit.



5. Important points on operation by HA system

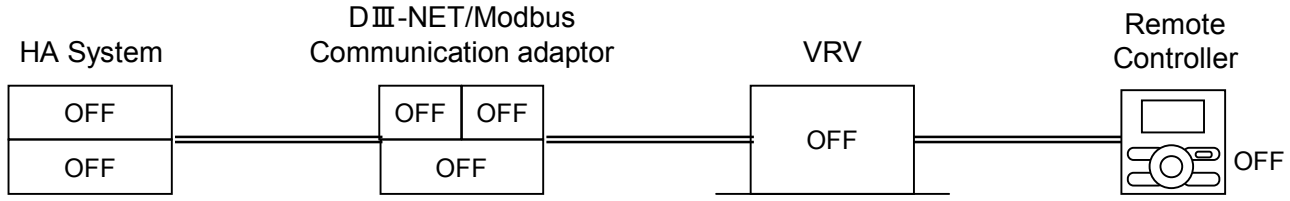
DⅢ-NET/Modbus Communication adaptor sends the command to VRV when the value of a Holding Register is changed.
Specially in case that indoor units are operated from remote controller, HA system always have to get the status of indoor units and set the getting status to Holding Resisters.
Below is example for ON/OFF operation.

Note
The interval setting to the same register is over 0.5s.

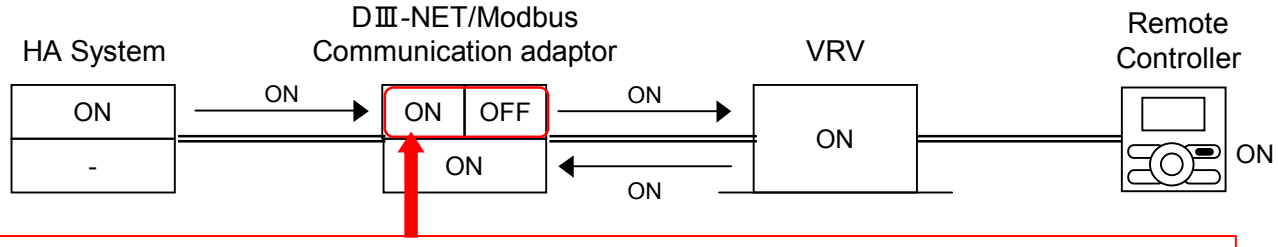
[Explanatory note]

[Process for On/Off operation]

1.HA system gets the status of indoor units and sets the getting status to Holding resisters.
It is premise that the status of indoor unit is “OFF”.

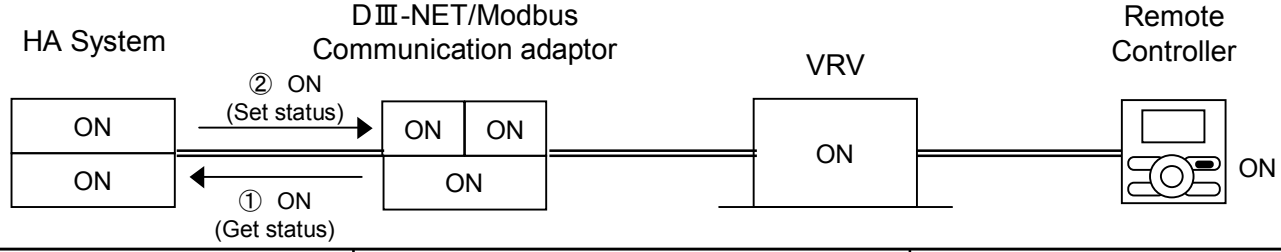


2.The indoor unit is operated “ON” by HA system

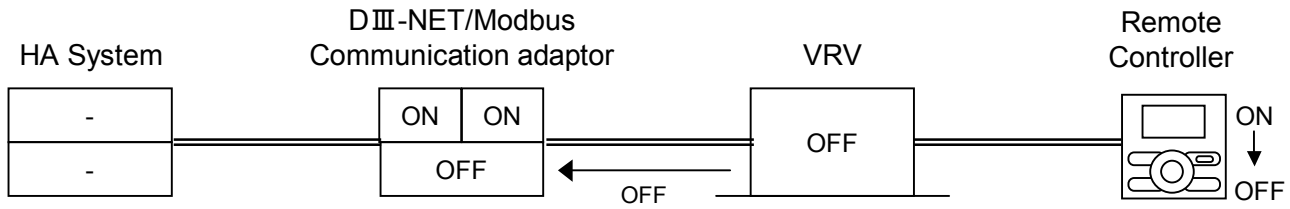


The status of Holding Register changed.
So, DⅢ-NET/Modbus Communication adaptor sends command “ON” to VRV.

3.HA system gets the status of indoor units and sets the getting status to Holding Registers.

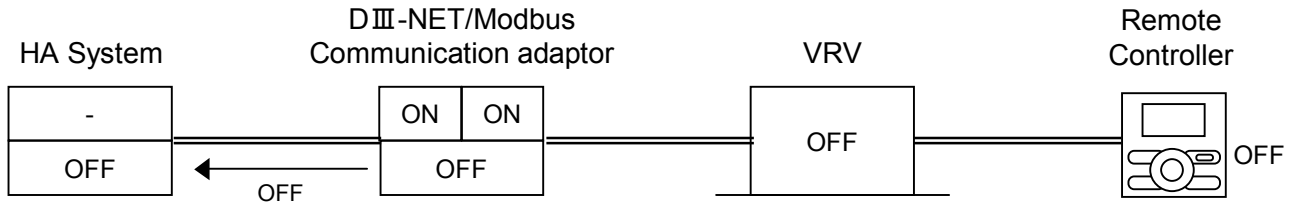


4.The indoor unit is operated “OFF” by remote controller.

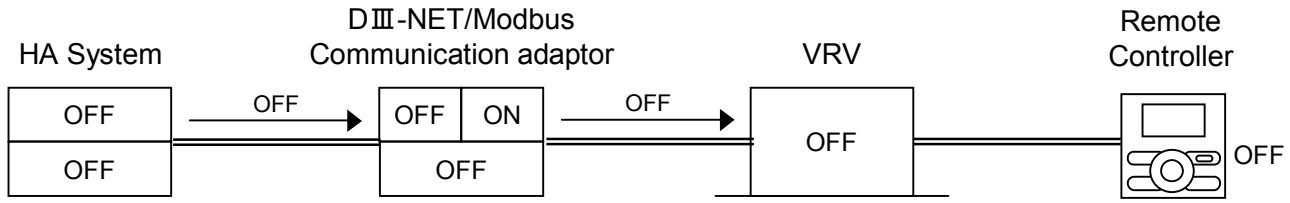


5.HA system gets the status of indoor unit and sets the getting status to Holding Register.

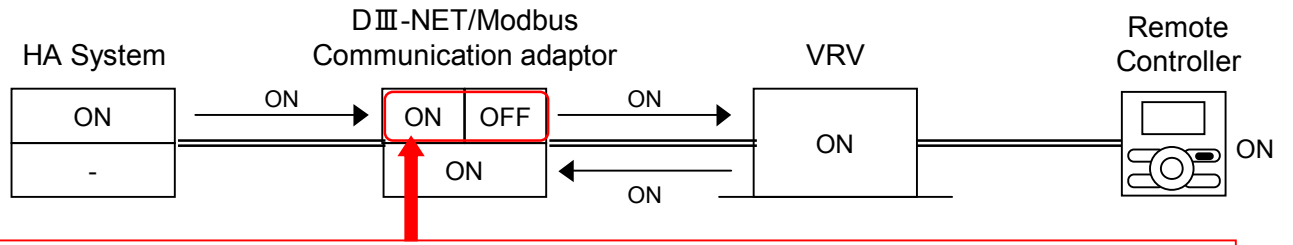
<Getting the status of indoor unit>



<Setting the getting status for indoor unit>

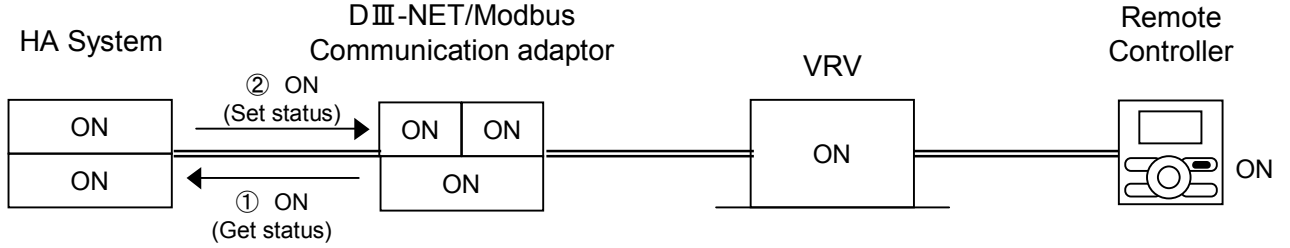


6.The indoor unit is operated “ON” by HA system



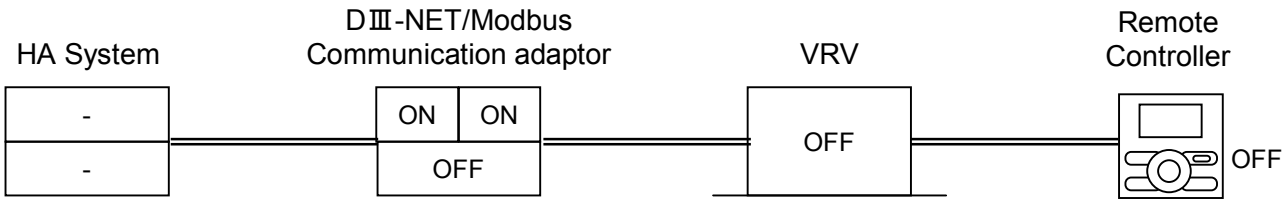
The status of Holding Register changed.
So, DⅢ-NET/Modbus Communication adaptor sends command “ON” to VRV.

7.HA system gets the status of indoor units and sets the getting status to Holding resisters.

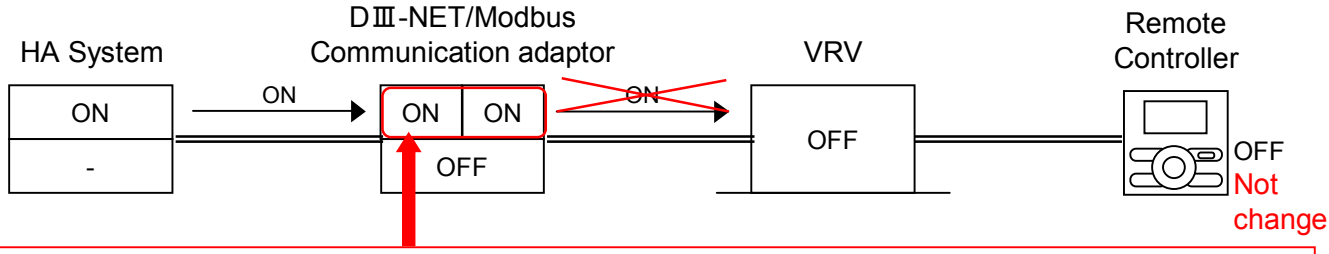


NOTE: In the case that HA system do not carry out operation 5, and HA system carry out operation 6.

<Status>



<The indoor unit is operated “ON” by HA system>



The status of Holding Register do not change.
So, DⅢ-NET/Modbus Communication adaptor do not send command “ON” to VRV.

6.Error code mapping table

Value2	Code
0	0
1	A
2	C
3	E
4	H
5	F
6	J
7	L
8	P
9	U
10	9
11	8
12	7
13	6
14	5
15	4
16	3
17	2
18	1
19	G
20	K
21	M
22	N
23	R
24	T
25	V
26	W
27	X
28	Y
29	Z
30	*
31	

Value1	Code
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	A
11	B
12	C
13	D
14	E
15	F

Example

Value1 = 4
Value2 = 9

Error code = U4